Contribution ID: **697** Type: **Poster**

b-jet tagging in pp collisions using graph neural networks with the ALICE experiment

The production of beauty quarks can be calculated within perturbative Quantum Chromodynamics (pQCD) due to their large mass, allowing for precise comparisons with experimental results. Beauty-quark tagged jets (b-jets) allow to experimentally reconstruct the kinematics of the scattered beauty quark and probe its subsequent shower evolution.
Nonetheless, traditional b-jet tagging algorithms (e.g. impact parameter or secondary vertex methods) are constrained in their performance due to the complexity of reconstructing the decay of beauty-hadrons. In this poster, we aim to enhance the efficiency and purity of b-jet tagging in pp collisions, especially in the low-p_{T} region, by applying a Graph Neural Network (GNN) tagging method, which is a high-performance deep learning approach capable of comprehensively assessing the relationships among jet constituent tracks and the topological structure of the decay. Combining this approach with the enhanced pointing resolution of the ALICE detector in Run 3, enables more precise b-jet analyses in the low-p_{T} region, both in pp and Pb–Pb collisions.
We will discuss the development status of the GNN b-jet tagging method and present the computed b-jet cross section using this method.

Category

Experiment

Collaboration (if applicable)

ALICE

Author: CHOI, Changhwan (Pusan National University (KR))

Presenter: CHOI, Changhwan (Pusan National University (KR))

Session Classification: Poster session 1

Track Classification: Jets